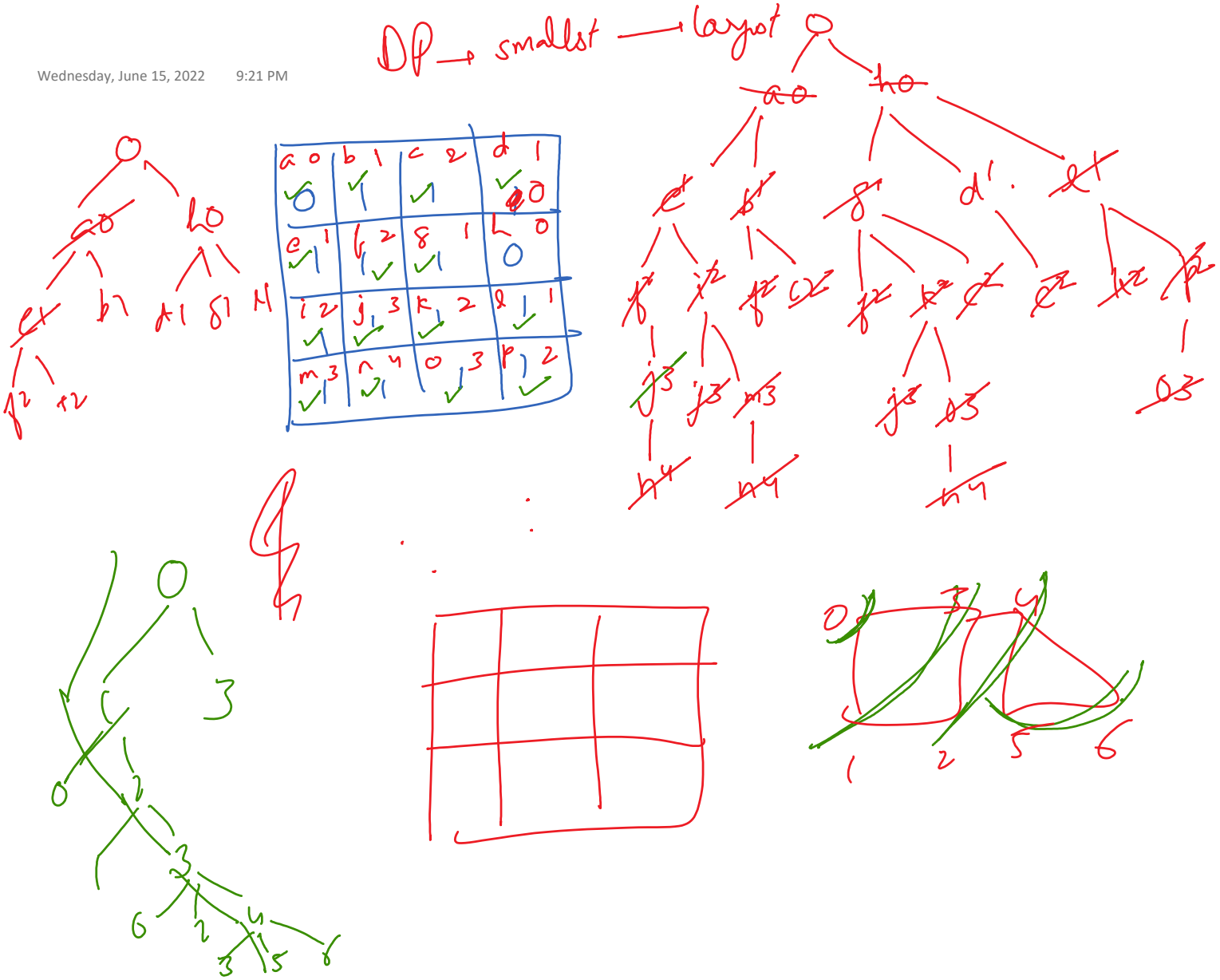
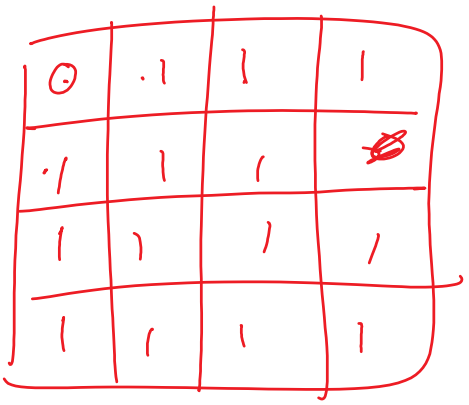
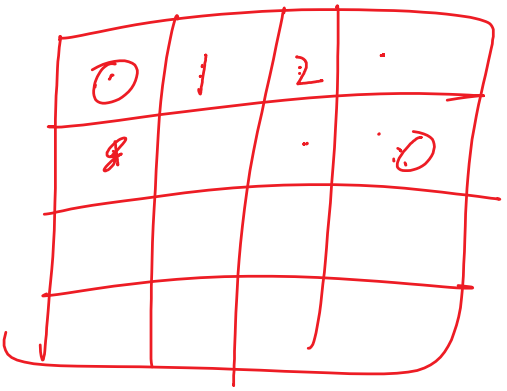
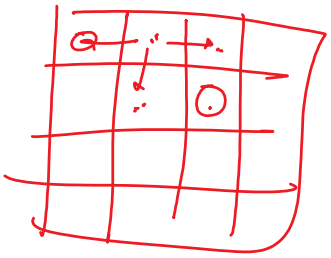
Wednesday, June 15, 2022 9:21 PM



BFS → DP

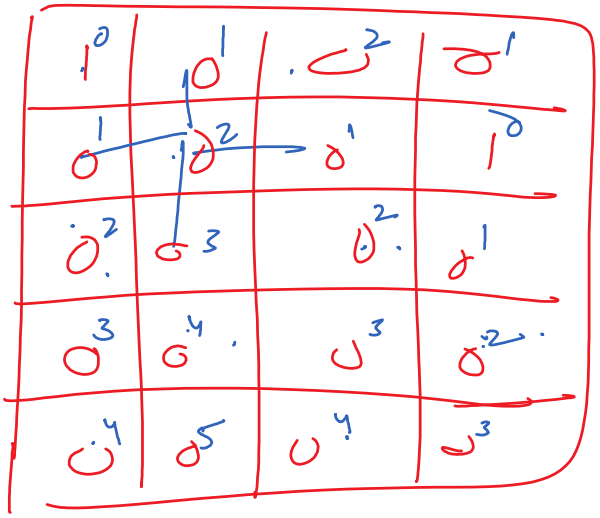






DP → Topological

V ≠ E



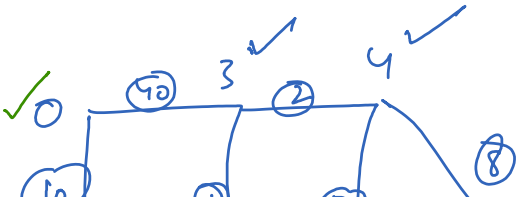
1 — 1

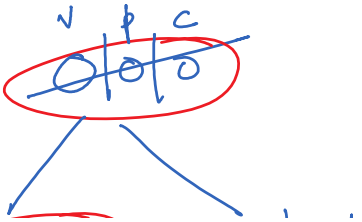
8 : 16 — 10 : 30

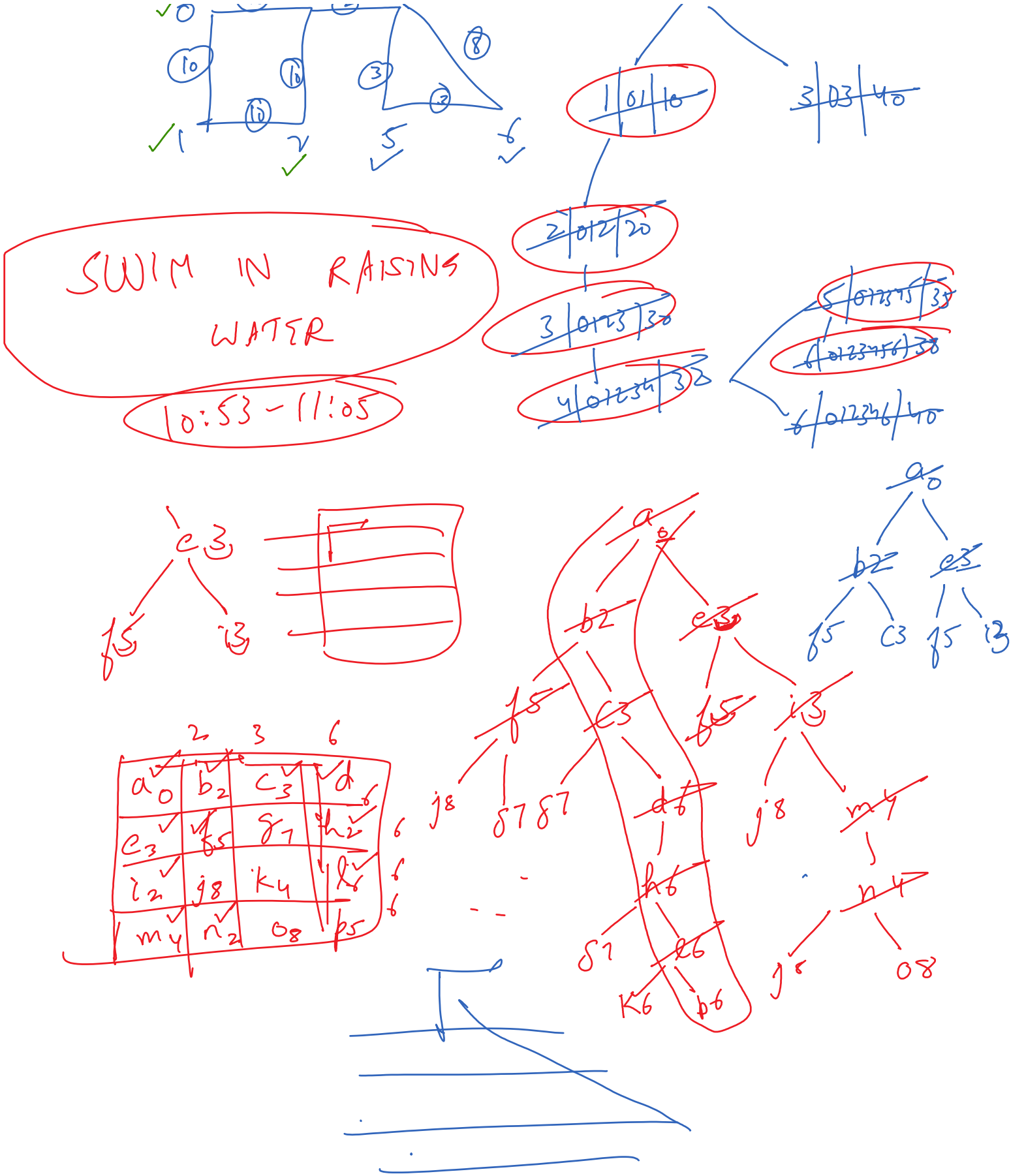
V ≠ E

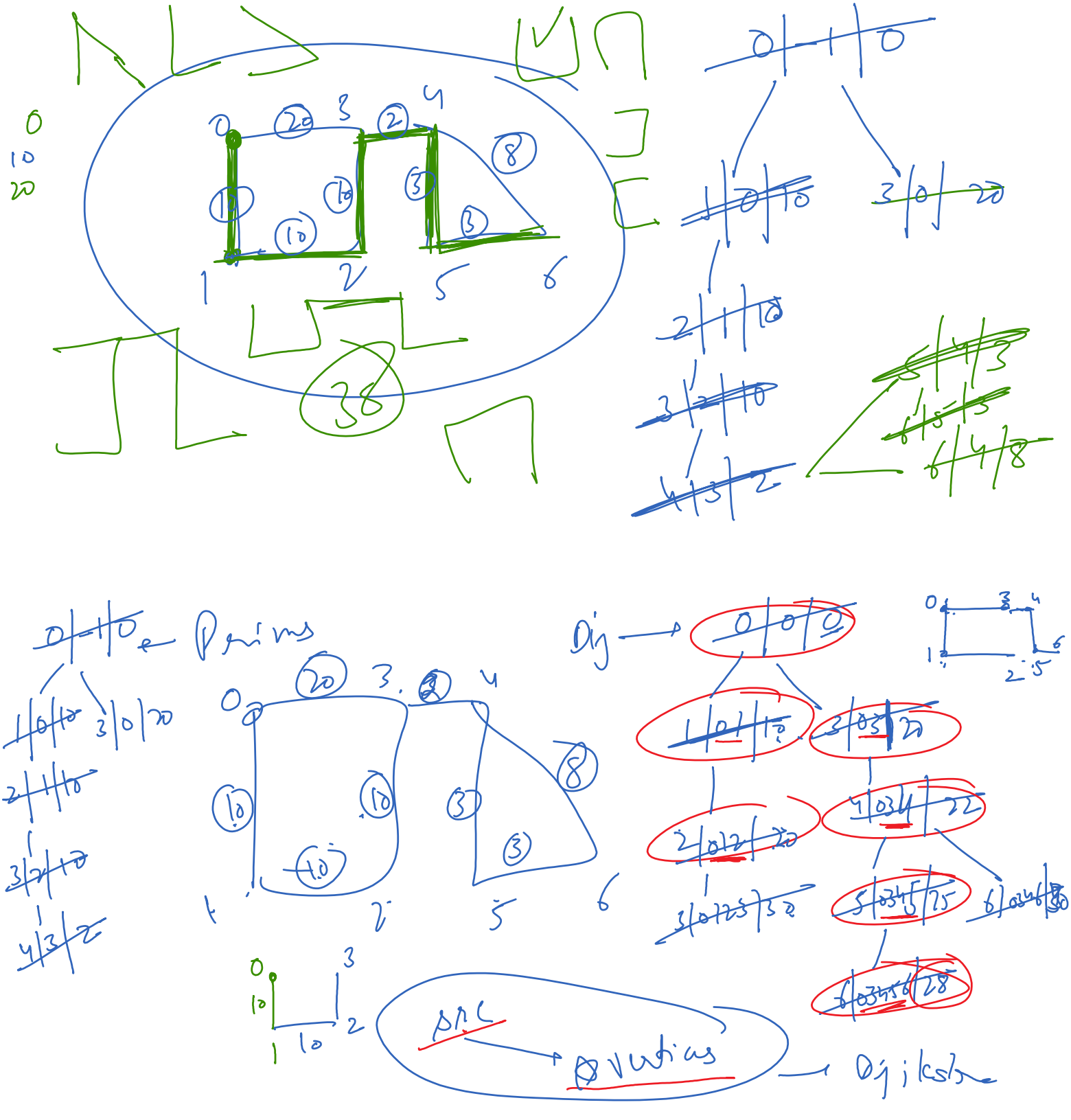
n ≠ m + 4 (n ≠ m)

n ≠ m






SWIM IN RAISING WATER
10:53 - 11:05


Prims
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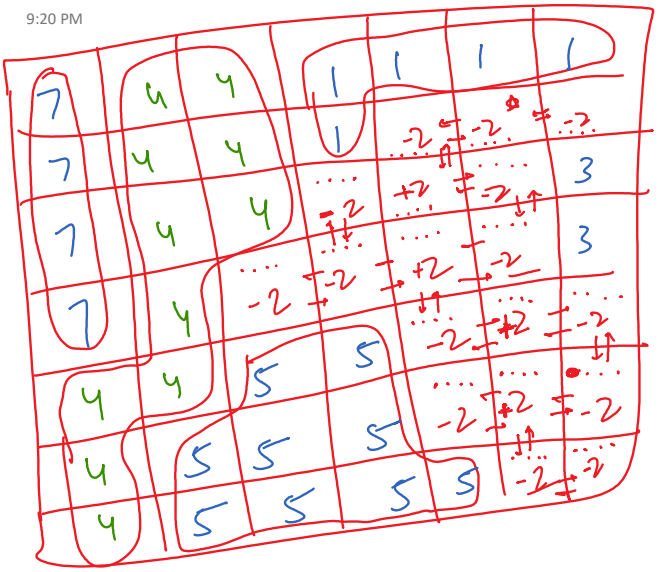
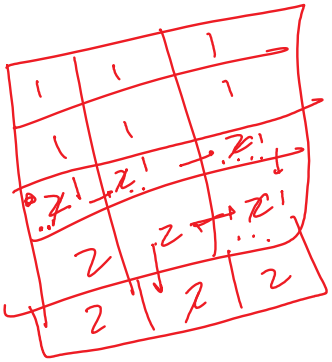
NEWS



8

9:35-9:50



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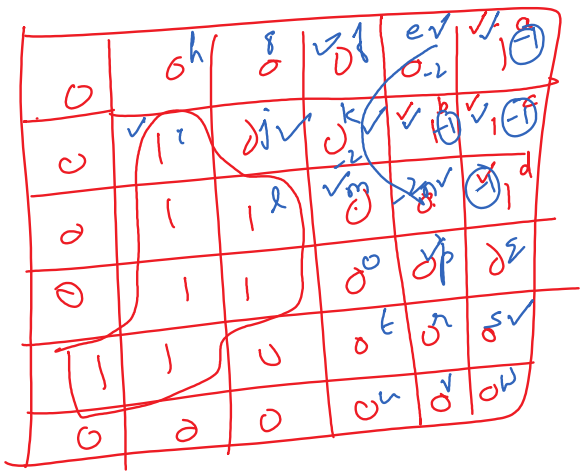
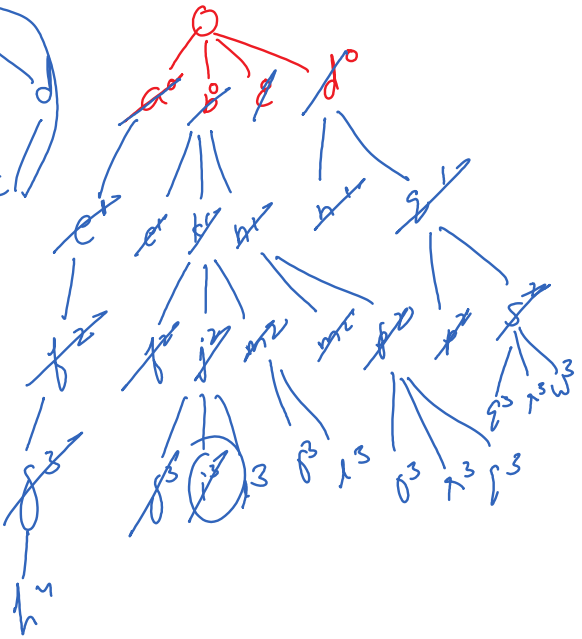
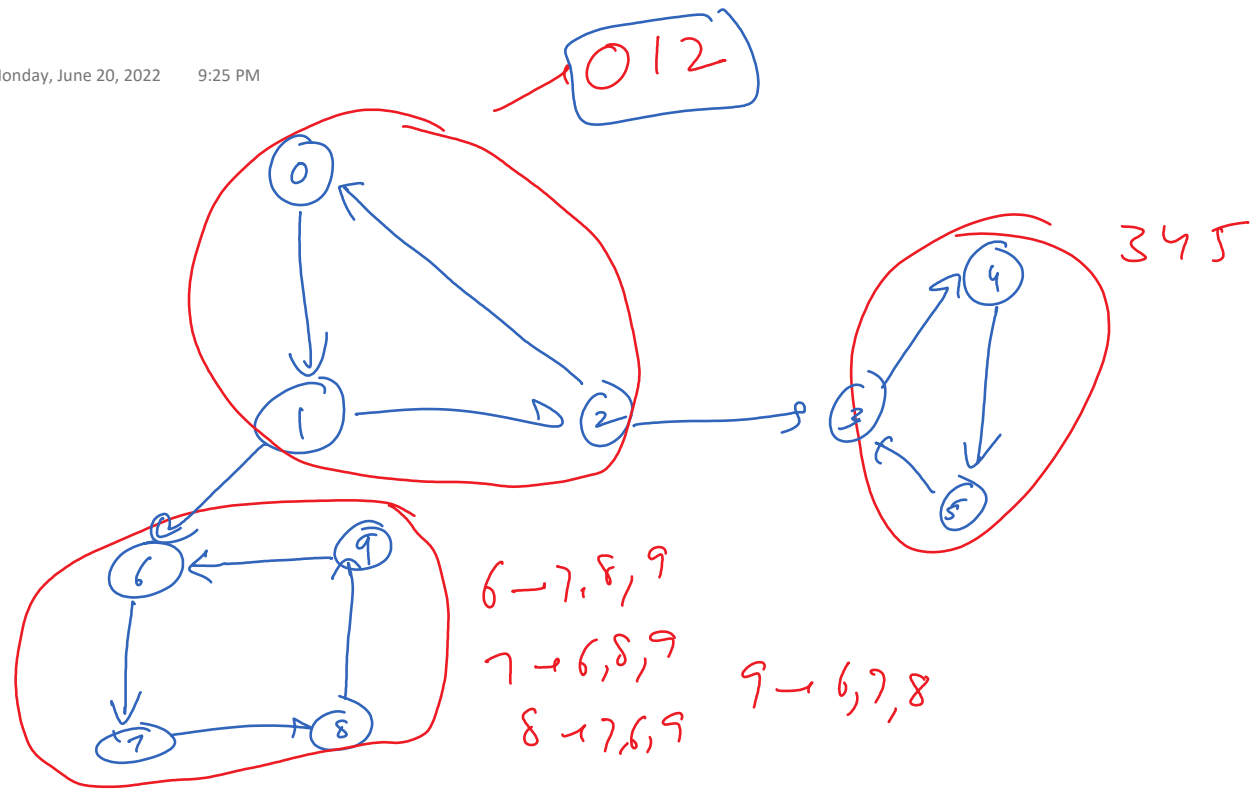
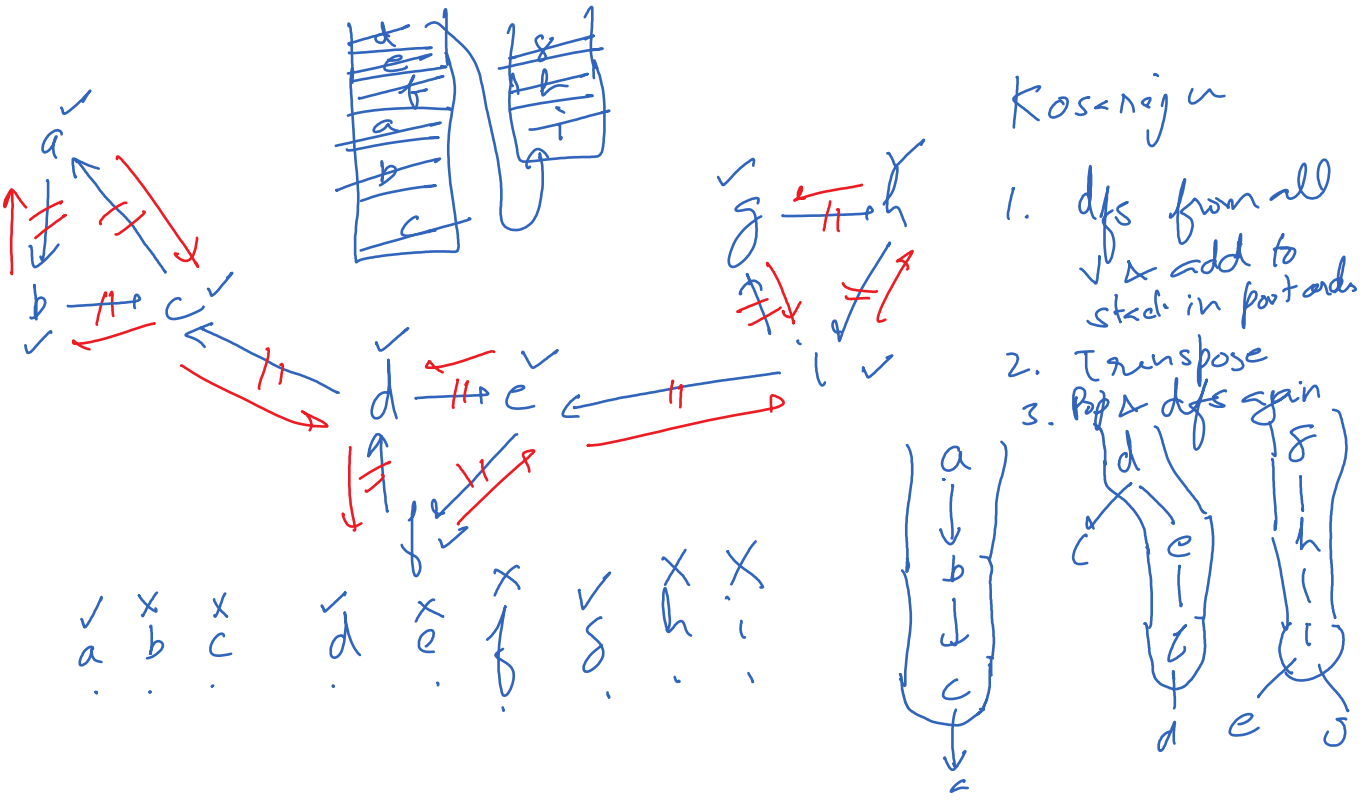




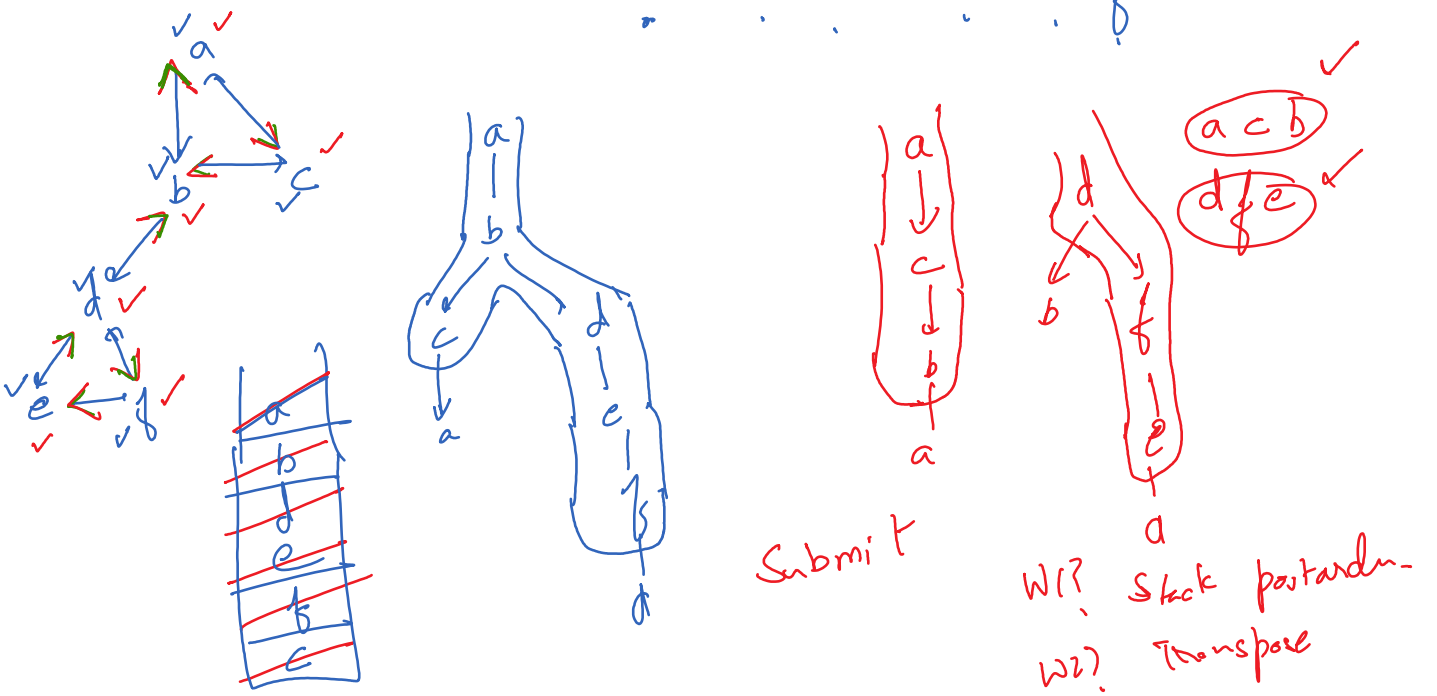
Monday, June 20, 2022 9:25 PM

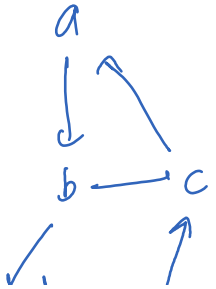


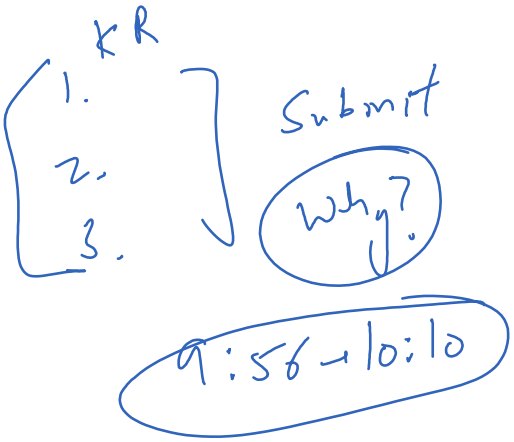


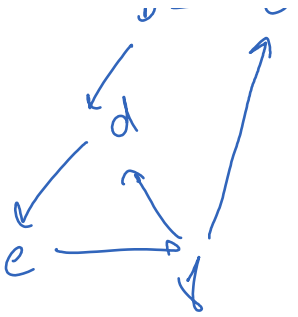
Kosa raju Algorithm.

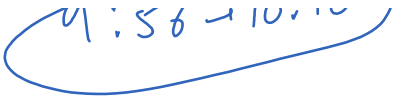
1. Dfs from all vces as root, add to st. in postorder.
2. Transpose
3. Pop from st, do dfs with popped vertex as root → SCC

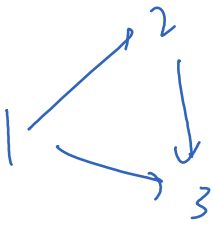








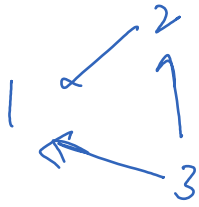




1 → 2, 3

2 → 3

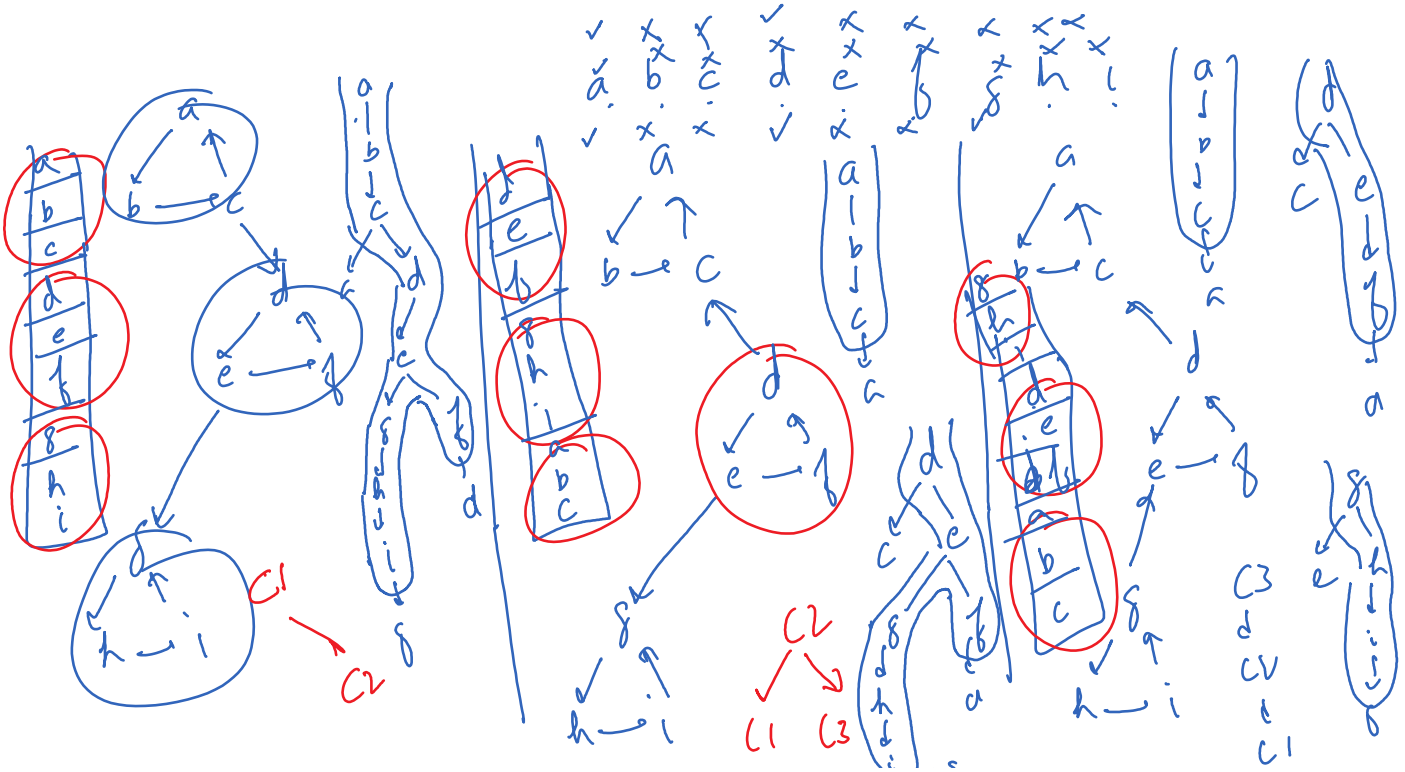
3 → [ ]

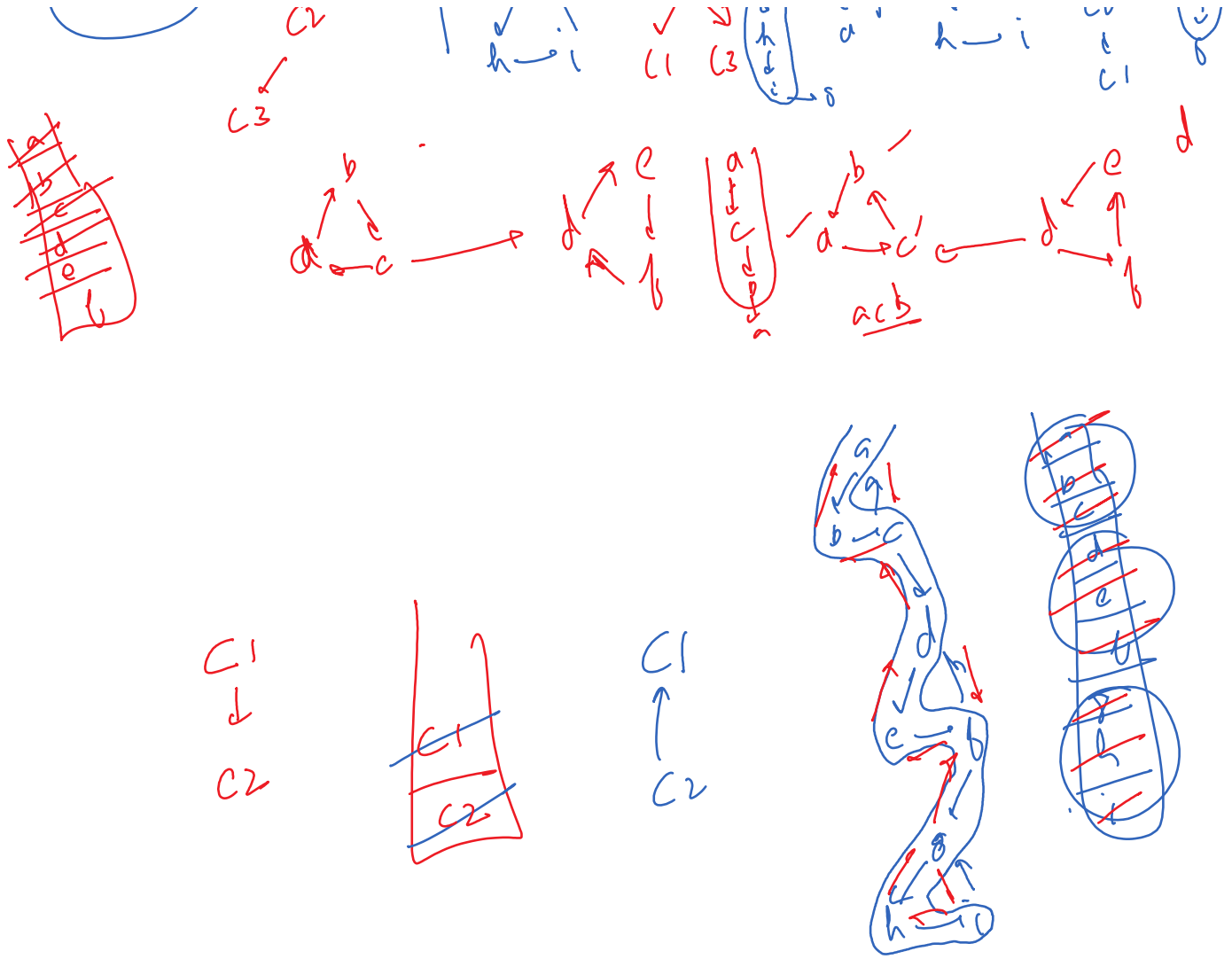


1 → [ ]

2 → 1

3 → 1, 2

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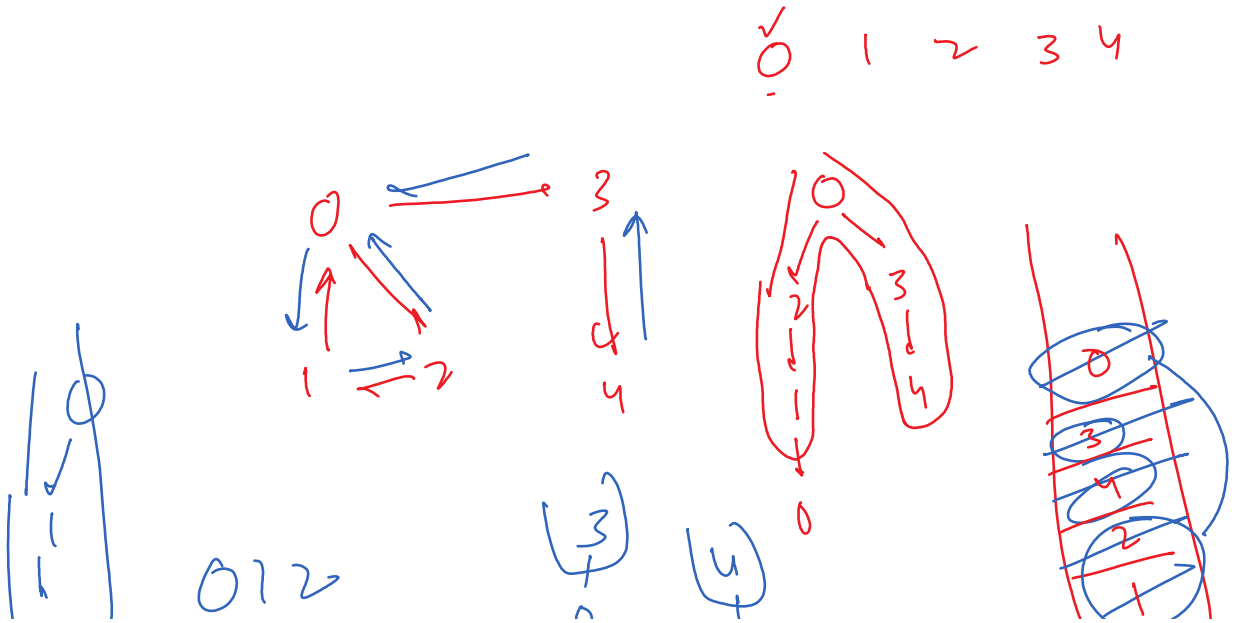
c3
c1
c3
acb

C1
C2
C1
C2
C1
C2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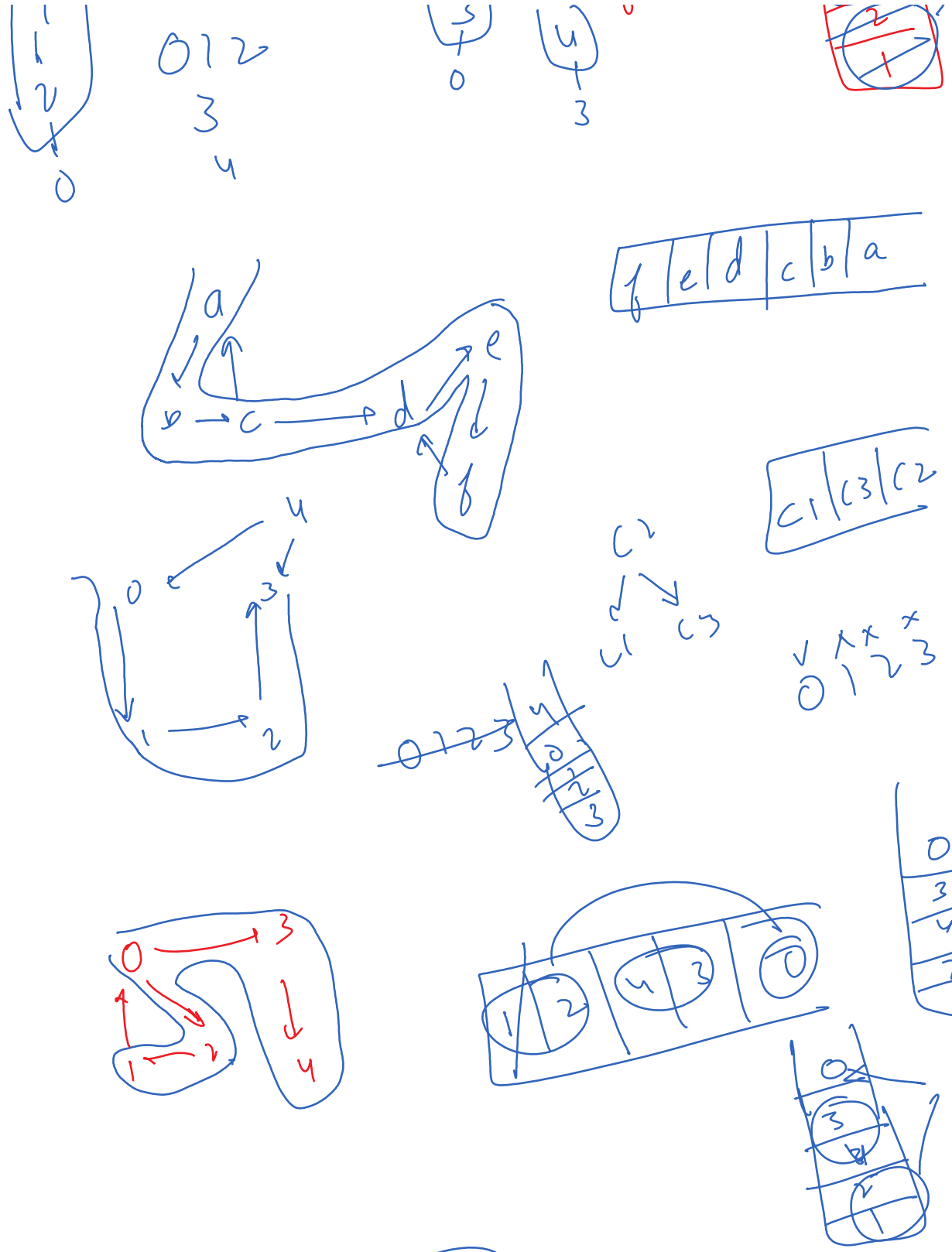
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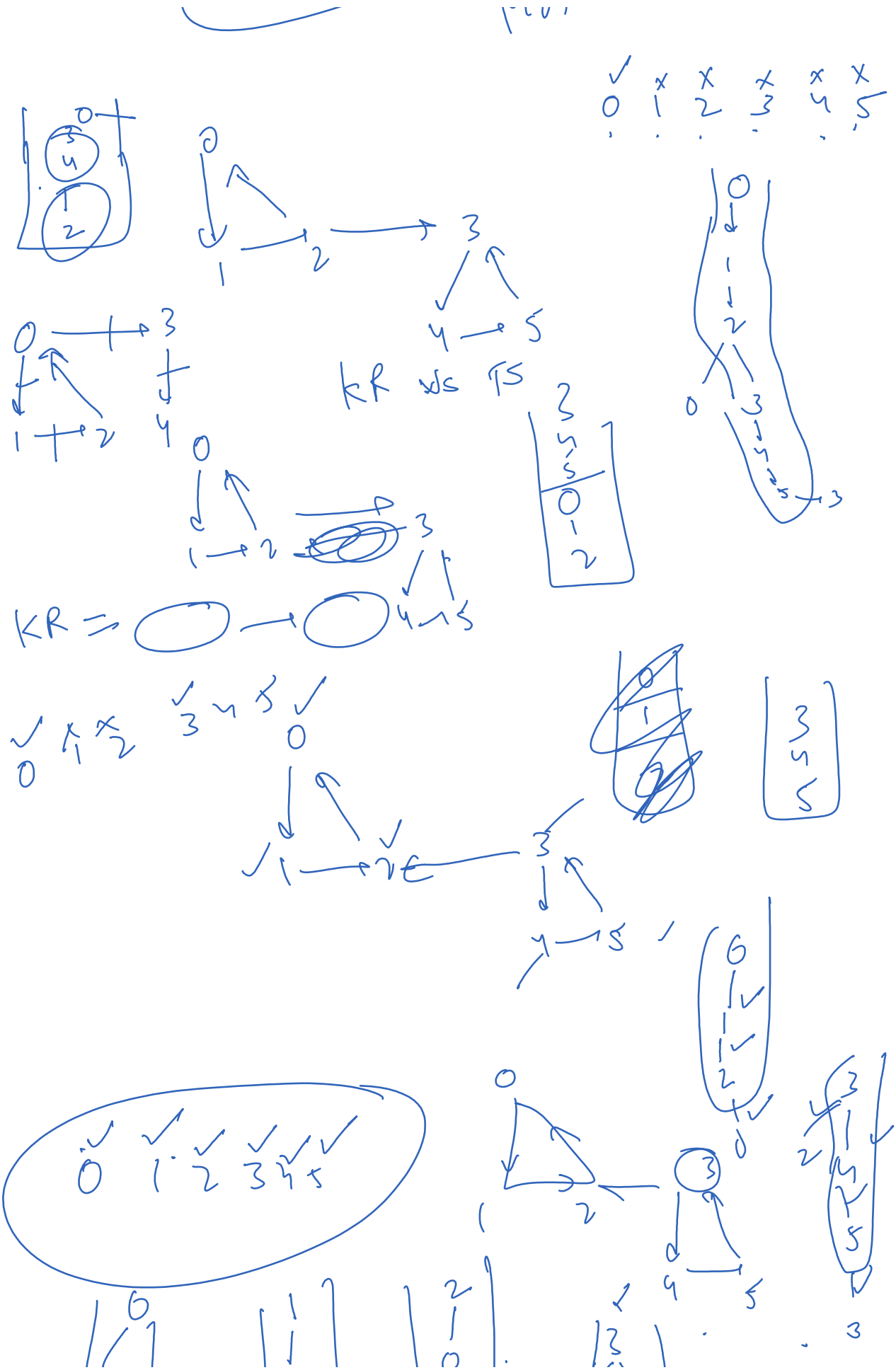
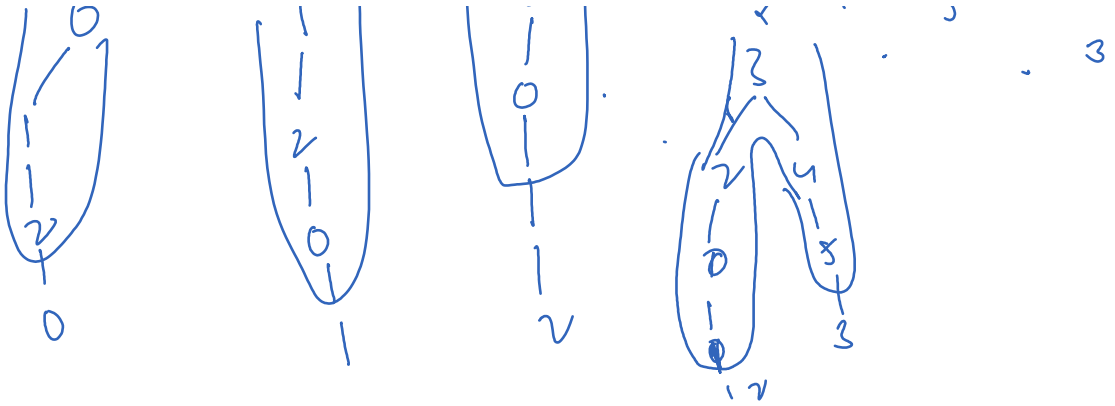
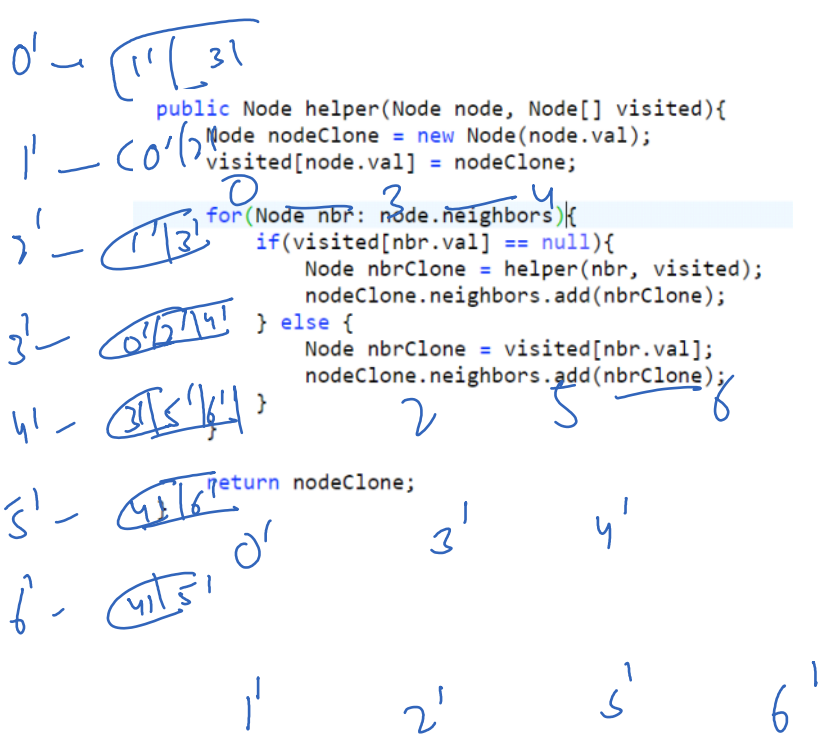
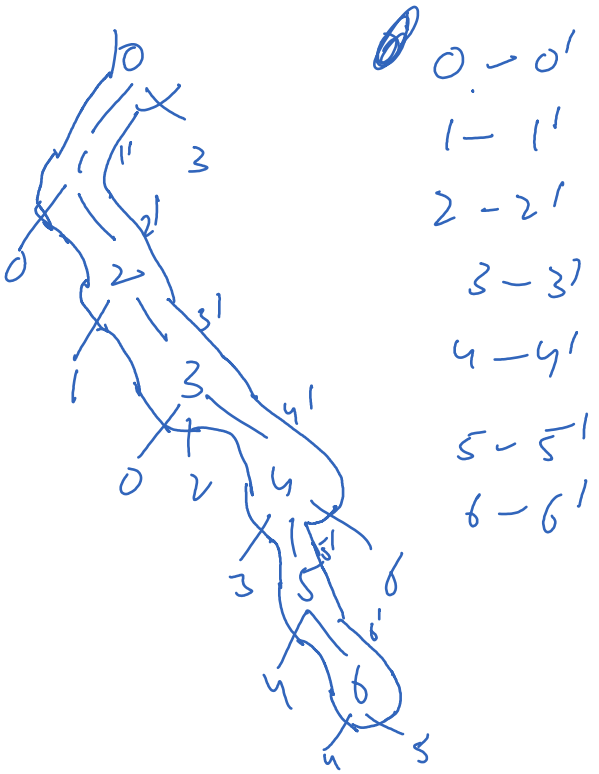
→ Mohan Vertex

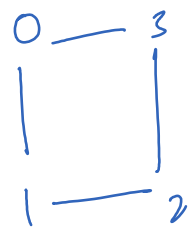

KR ws TS
KR

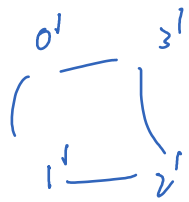


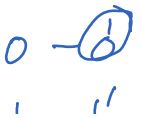
```
public Node helper(Node node, Node[] visited){
    Node nodeClone = new Node(node.val);
    visited[node.val] = nodeClone;

    for(Node nbr: node.neighbors){
        if(visited[nbr.val] == null){
            Node nbrClone = helper(nbr, visited);
            nodeClone.neighbors.add(nbrClone);
        } else {
            Node nbrClone = visited[nbr.val];
            nodeClone.neighbors.add(nbrClone);
        }
    }

    return nodeClone;
}
```



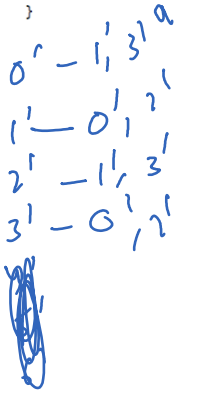


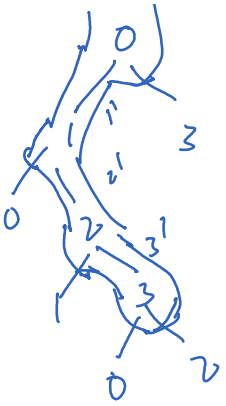


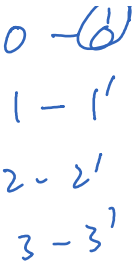




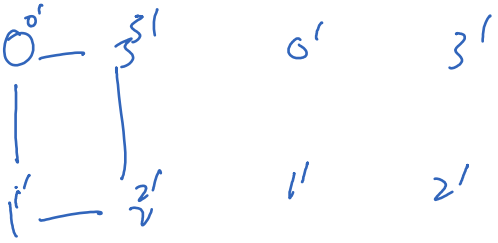
```
        return nodeClone;
    }
```

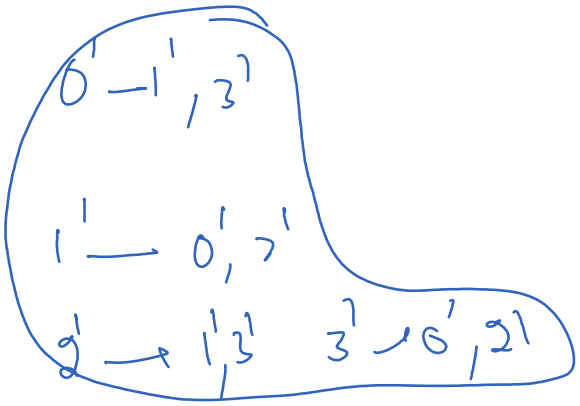






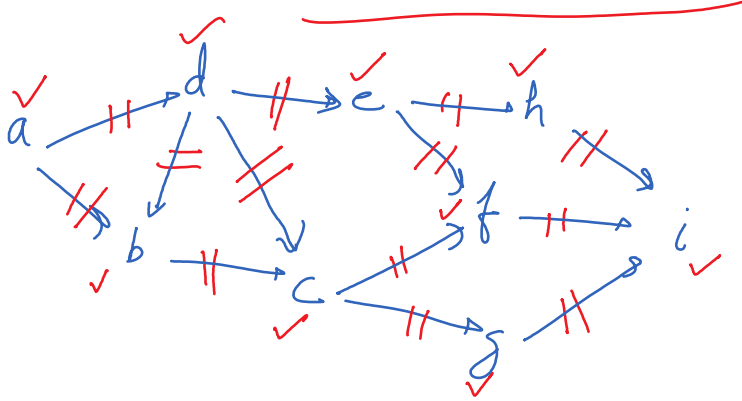
```
public Node helper(Node node, Node[] visited){
    if(visited[node.val] != null){
        return visited[node.val];
    } else {
        Node nodeClone = new Node(node.val);
        visited[node.val] = nodeClone;

        for(Node nbr: node.neighbors){
            Node nbrClone = helper(nbr, visited);
            nodeClone.neighbors.add(nbrClone);
        }

        return nodeClone;
    }
}
```



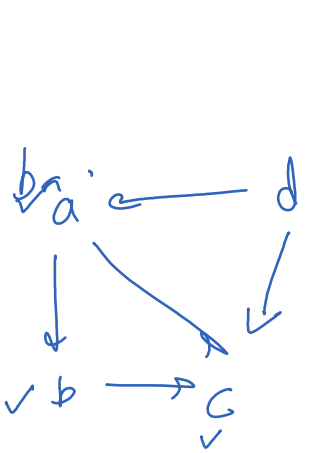


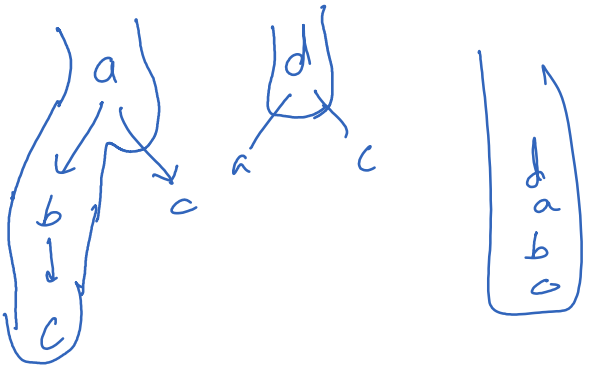
Tuesday, June 21, 2022 9:23 PM

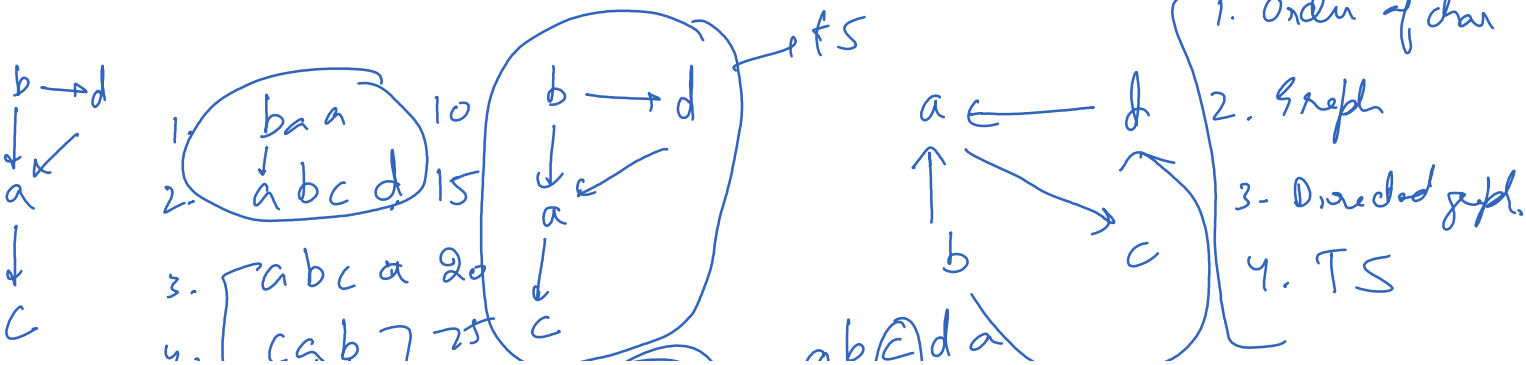
a d e h b c g f i

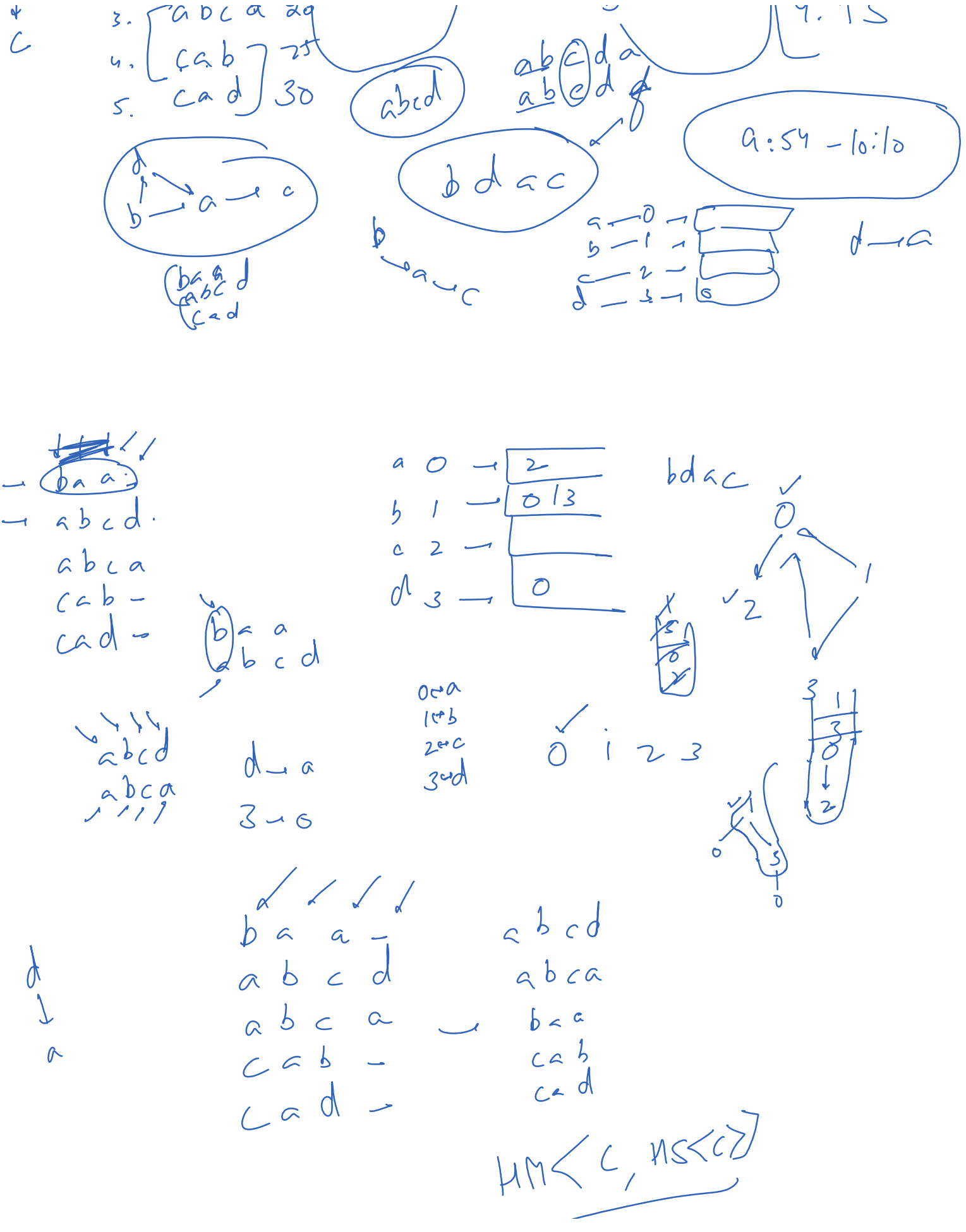


a b c d e f g h i





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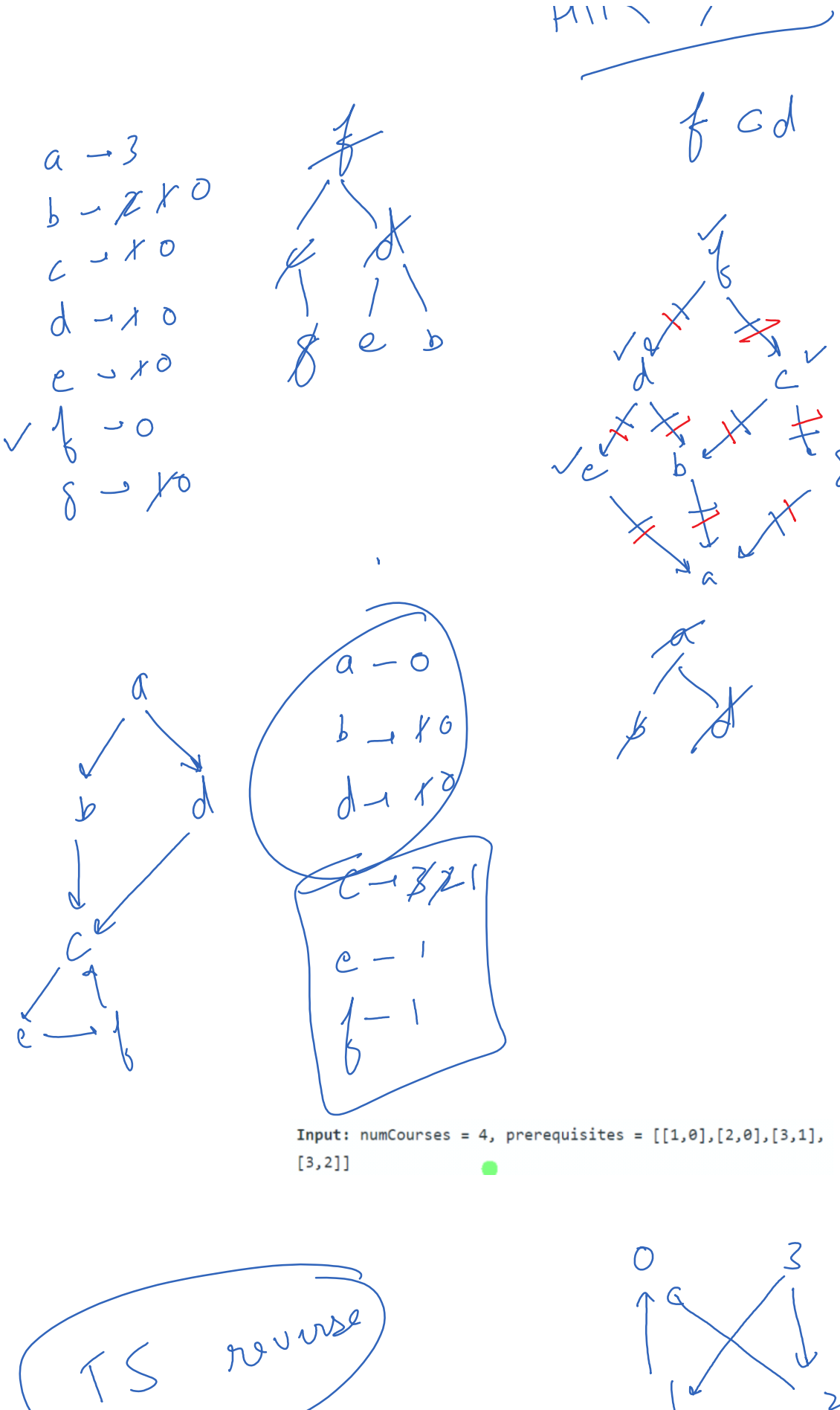

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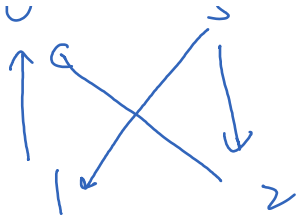
TS reverse



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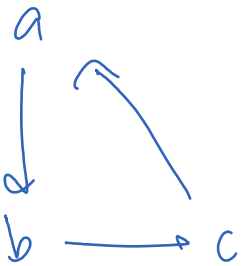
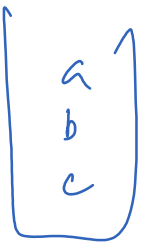
3 2 1 0

11:34 – 11:50

a b c





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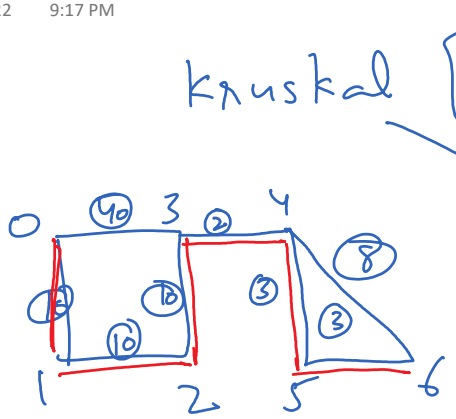
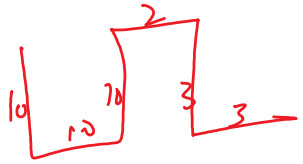
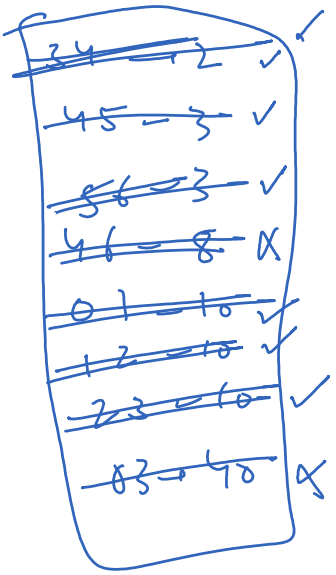
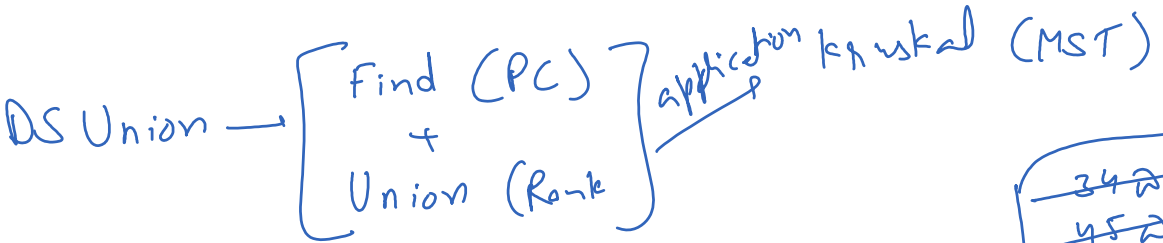


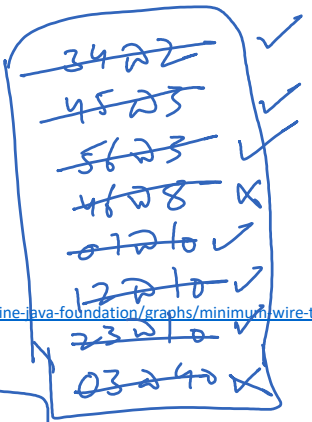


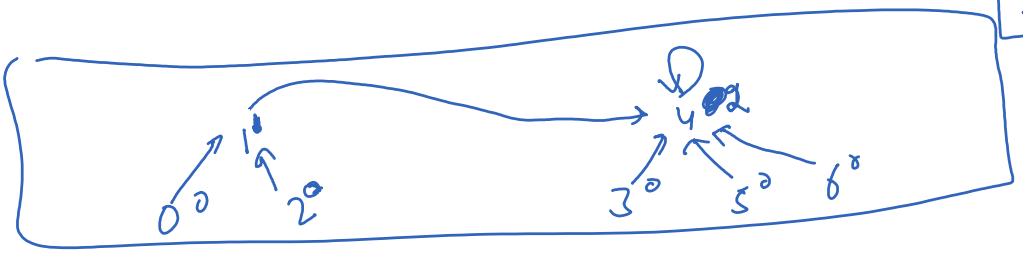


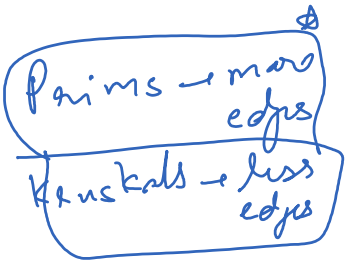


3-4@2
6-5@3
4-5@3
0-1@10
3-2@10
1-2@10

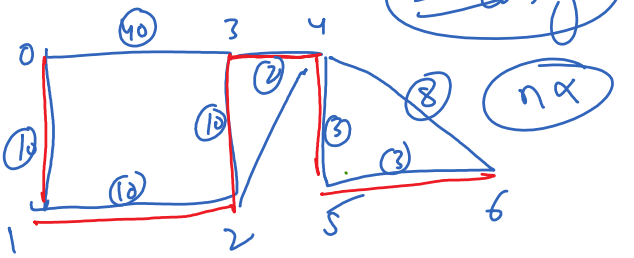
From <https://pepcoding.com/resources/online-java-foundation/graphs/minimum-wire-to-connect-all-pcs-official/ojquestion>

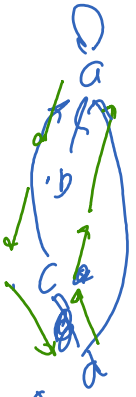


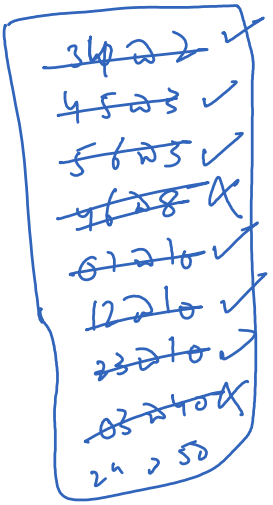


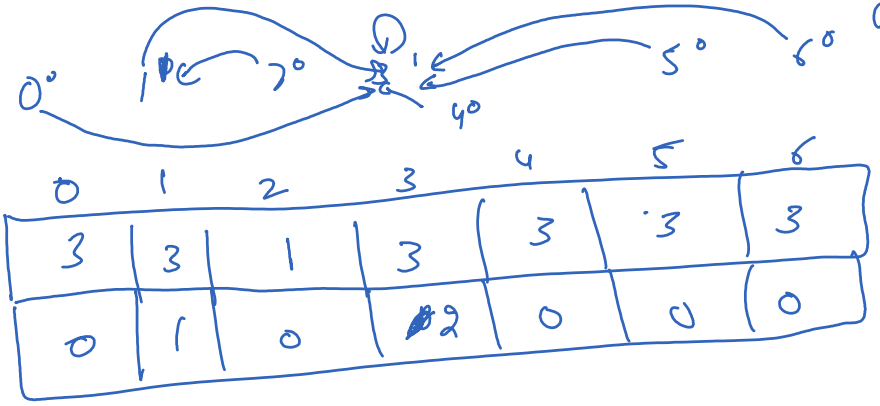


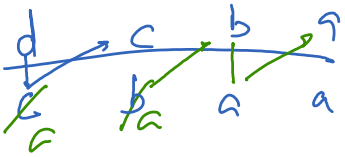
2nd situation

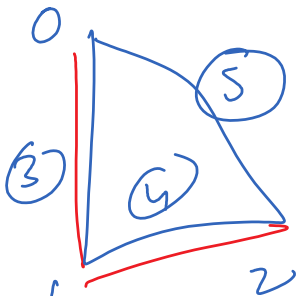


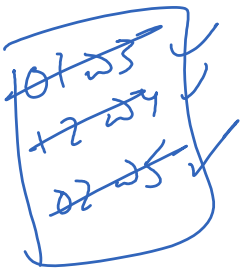


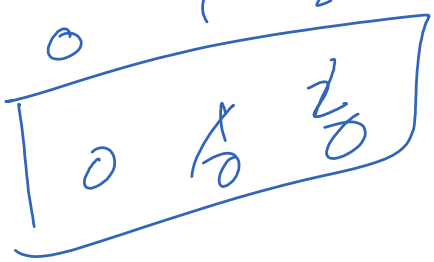


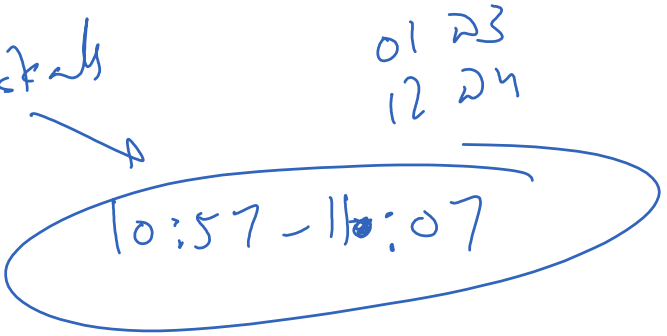






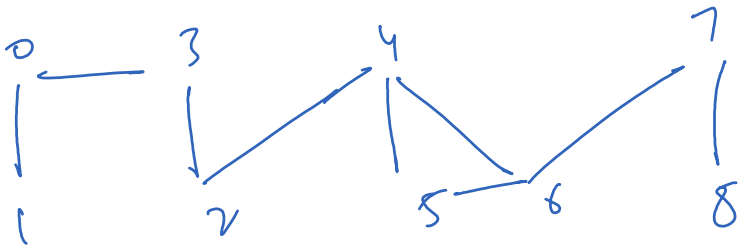






Graph Static → BFS DFS (V+E)

Graph Dynamic

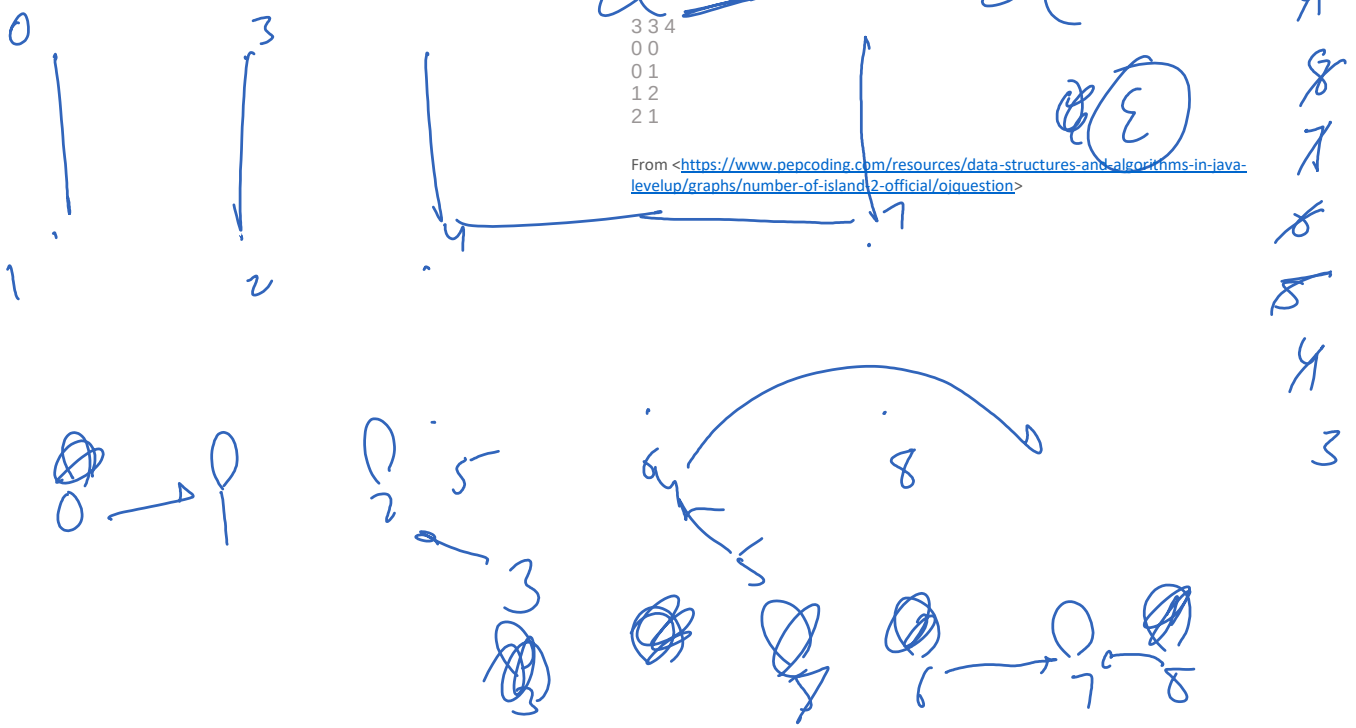


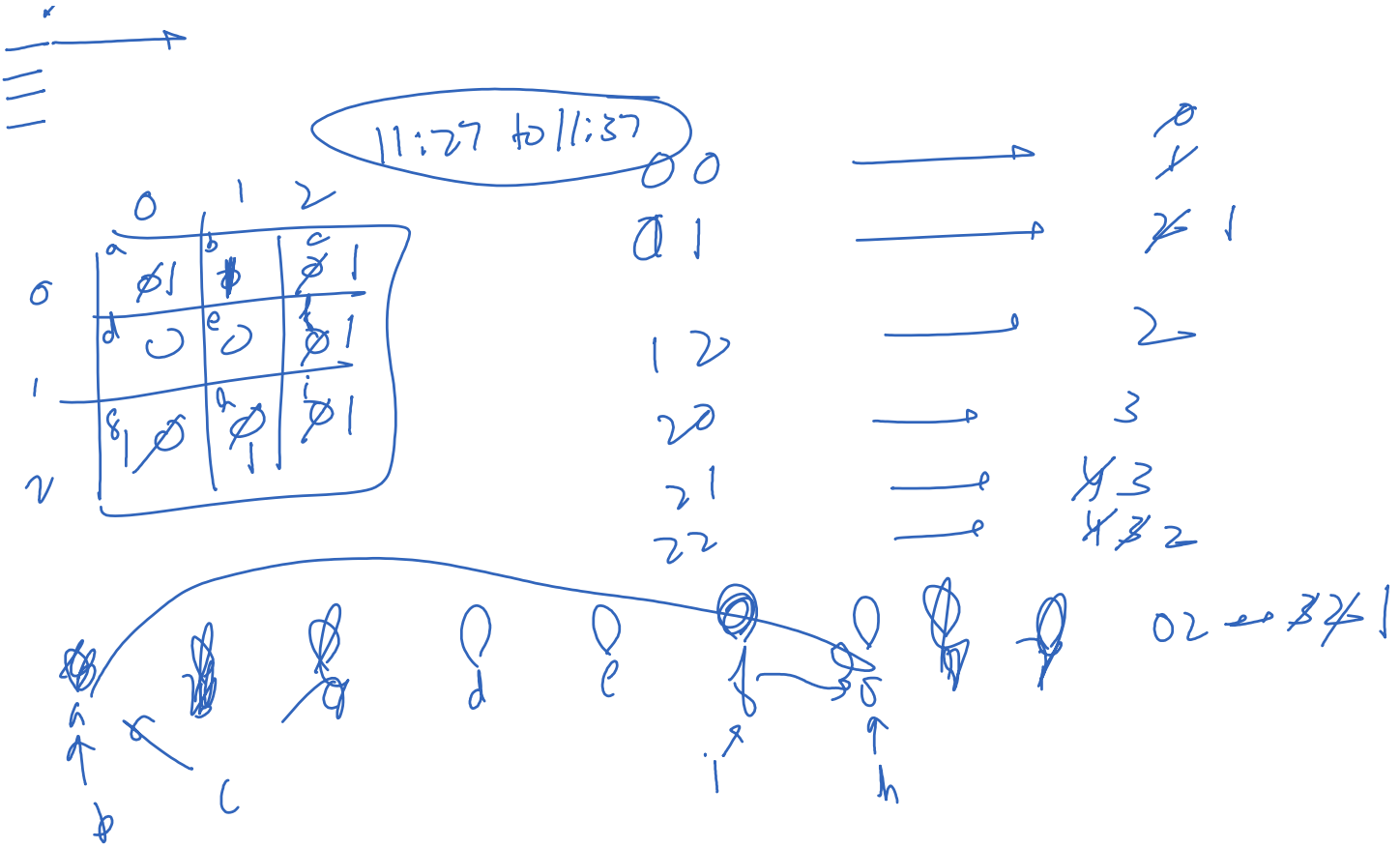
BFS-DFS → DSU

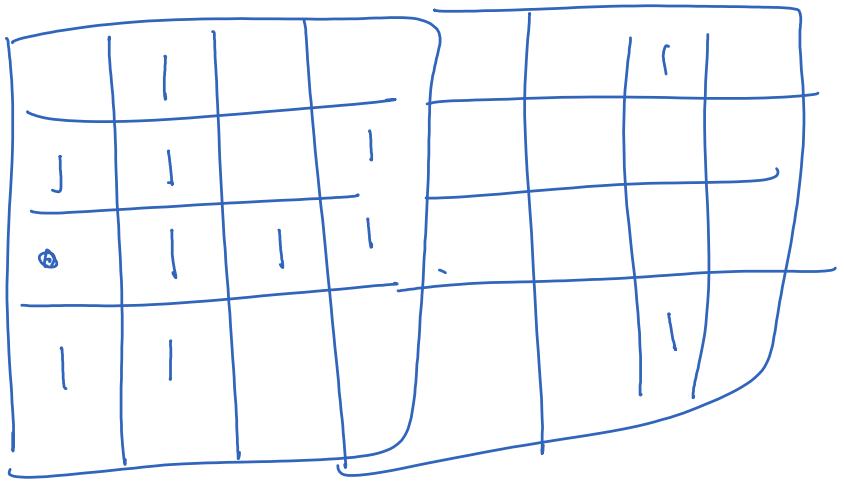
E(V+E) E(O(1))

3 3 4
0 0
0 1
1 2
2 1

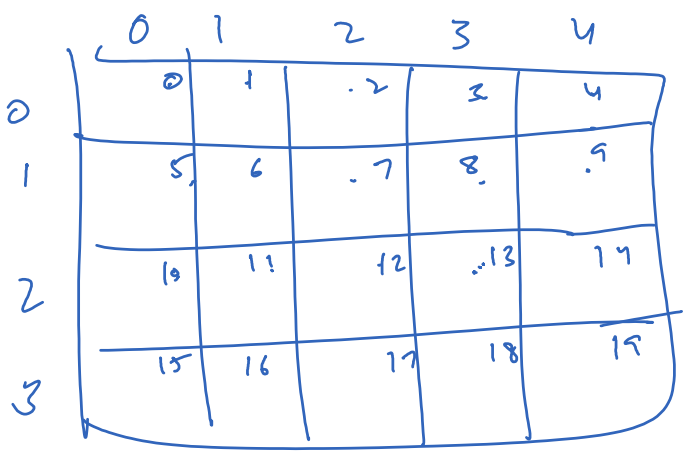
From <https://www.pepcoding.com/resources/data-structures-and-algorithms-in-java-levelup/graphs/number-of-islands-2-official/ojquestion>







New Section 1 Page 21



$y \propto \sqrt{5}$

$m \propto n$

$bno = 2 \times n + c$

$2 \propto 5 + 3$